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BEFORE THE ARIZONA CORPORATION COMMISSION

Arizona Corporation Commission
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IN THE MATTER OF THE FILING BY TUCSON ELECTRIC POWER COMPANY TO AMEND DECISION NO. 62103.	DOCKET NO. E-01933A-05-0650 **TUCSON ELECTRIC POWER COMPANY'S RESPONSE TO STAFF'S EIGHTH SET OF DATA REQUESTS**

Tucson Electric Power Company ("TEP"), through undersigned counsel, hereby responds to "Staff's Eighth Set of Data Requests for TEP" as follows:

Provided herewith are Responses to Data Requests EAA 8.1 to EAA 8.17. Attached to the responses is a CD containing an excel file which is not bates stamped..

RESPECTFULLY SUBMITTED this 18th day of December 2006.

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Wherever possible when Staff requests copies, documents, charts, schedules, exhibits, etc., on this and all future data requests, please provide both a hard copy response along with an electronic version in Microsoft Word and/or Excel format, unless otherwise advised or otherwise not possible, such as in case of distribution and transmission system schematics.

Time-of-Use Program

EAA 8-1 Please specifically identify the proposed time-of-use program elements that TEP is requesting approval of in this proceeding.

RESPONSE: See the following page for a comparison of current rates and the proposed Time-of-Use ("TOU") residential and general service rates. Proposed TOU periods are shown in the TOU Period Comparison table. In both summer and winter periods, there will be at least 16 hours of off-peak service per day. As such, households with many different types of usage patterns will be able to find convenient, off-peak times for activities that have flexible schedules, such as washing and drying clothes, cooking and dishwashing. Moreover, customers with timers on water-heaters and/or pool pumps will have adequate hours available for these functions. The new schedules will therefore be "customer-friendly." Because relatively high demands can occur on Saturday, Sunday or holidays, these days have on-peak and shoulder periods listed under the preferred periods in the table on the following page. Of course, rate levels will be adjusted to reflect the addition of new peak hours. Finally, as the seasonal definition currently states, summer will cover May through October billings.

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Residential Comparison TEP current-proposed.

	Current Rate 1	Current Rate 70	Proposed Rate 70N
Summer (May-Oct)			
non-time differentiated	$ 0.090921		
On Peak		$ 0.184171	$ 0.154576
Shoulder		$ 0.116318	$ .100000
Off Peak		$ 0.058160	$ 0.058100
Winter (Nov-Apr)			
non-time differentiated	$ 0.078970		
On Peak		$ 0.126011	$ 0.131357
Off Peak		$ 0.043619	$ 0.043600

General Service Comparison TEP current-proposed.

	Current Rate 10	Current Rate 76	Proposed Rate 76N
Summer (May-Oct)			
non-time diff (1st 3400 kWh /mo)	$ 0.113695		
non-time diff (over 3400 kWh /mo)	$ 0.100343		
On Peak		$ 0.222943	$ 0.220115
Shoulder		$ 0.140551	$ 0.140917
Off Peak		$ 0.067853	$ 0.068244
Winter (Nov-Apr)			
non-time diff (1st 3400 kWh /mo)	$ 0.113695		
non-time diff (over 3400 kWh /mo)	$ 0.093772		
On Peak		$ 0.150244	$ 0.151184
Off Peak		$ 0.053312	$ 0.053649

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Time-Of-Use Period Comparison

	Current Pricing Plan 70 and 76	Preferred New Periods
Summer		
On-Peak	1 p.m. - 6 p.m. Weekdays (M-F) Except Holidays	2 p.m. - 6 p.m. All Days
Shoulder	6 p.m. (noon) - 8 p.m. Weekdays (M-F) Except Holidays	12 p.m. (noon) - 2 p.m. & 6 p.m. - 8 p.m. All Days
Off-Peak	12 a.m. (midnight) - 1 p.m. & 8 p.m. - 12 a.m. (midnight) Weekdays (M-F) Plus All Day Sat. and Sun. Plus All Day Holidays	12 a.m. (midnight) - 12 p.m. (noon) & 8 p.m. - 12 a.m. (midnight) All Days

Winter		
On-Peak	7 a.m. - 11 a.m. & 6 p.m. - 9 p.m. Weekdays (M-F) Except Holidays	6 a.m. - 10 a.m. & 5 p.m. - 9 p.m. All Days
Off-Peak	12 a.m. (midnight) - 7 a.m. & 11 a.m. - 6 p.m. & 9 p.m. - 12 a.m. (midnight) Weekdays (M-F) Plus All Day Sat. and Sun. Plus All Day Holidays	12 a.m. (midnight) - 6 a.m. & 10 a.m. - 5 p.m. & 9 p.m. - 12 a.m. (midnight) All Days

Note: Holiday Definition under Current Rate 70 and 76:
Observed days for, New Years Day, Memorial Day, Independence Day,
Labor Day, Thanksgiving Day, Chistmas Day.

RESPONDENT: Bentley Erdwurm

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EAA 8-2 When does TEP propose that these elements referred to above be adopted? For instance, at the conclusion of this proceeding or after some future proceeding such as a rate case.

RESPONSE: The TOU Tariffs would go into effect after a final resolution of all issues raised in the case.

RESPONDENT: Toby Voge

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EAA 8-3 TEP response to BK 4-1 indicates that the TOU rates discussed in this application are under development. When does TEP anticipate that it would submit its proposed TOU rate designs to the Commission for approval?

RESPONSE: Please see the response to EAA 8-1.

RESPONDENT: Bentley Erdwurm

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EAA 8-4 If TEP has knowledge of mandatory TOU programs adopted in jurisdictions other than Arizona, please identify the utility and jurisdiction.

RESPONSE: TEP is aware that Madison Gas and Electric (Wisconsin) adopted a mandatory TOU rate for its residential customers that exceed 130 kWh per day during the summer period.

RESPONDENT: Toby Voge

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EAA 8-5 Based on TEP's knowledge of its customer base and usage characteristics, does TEP anticipate that some residential or non-residential customers on TEP's system would not be able to shift usage to off-peak time periods? If so, please identify these types of customers.

RESPONSE: Few customers would be unable to shift any load. Those customers unable to shift load are likely to be high load factor non-residential loads. An industrial process that runs all day at a constant level (e.g., 200 kW) would have a load factor close to 100%. While the process cannot be "shifted," the load is a good application of TOU. The 100% load factor customer (a customer using the same amount constantly) purchases a relatively large portion of its load during the off-peak period, and will consequently see a smaller average electricity price compared to purchasing the same load under a non-time-differentiated rate. Customers whose load is primarily food refrigeration (freezing) are similar high load factor customers.

Most TEP customers (residential and non-residential) have electric air conditioning and/or space heating loads. Pre-cooling (off-peak cooling in anticipation of on-peak needs) and pre-heating are money-saving options enabled by TOU. Under pre-cooling or pre-heating, on-peak (and higher priced load) is shifted to off-peak. TEP believes most customers can do at least a minimal amount of shifting to off-peak (*i.e.*, washing and drying clothes, dishwashing and pool pumping). TEP's proposed winter and summer TOU rates each have 16 hours per day in the off-peak period. This provides many opportunities for load shifting. TEP realizes that the extent of shifting depends on the construction type and appliance mix in each home or business. Better insulated homes are more suited for pre-cooling and pre-heating.

RESPONDENT: Bentley Erdwurm

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EAA 8-6 Has TEP conducted any studies or surveys that measure customer acceptability of mandatory TOU?

RESPONSE: TEP has not conducted any studies or surveys that measure customer acceptability of mandatory TOU.

RESPONDENT: Toby Voge

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EAA 8-7 Please identify in Excel format a list of all current rate schedules with the customer counts and associated kWh sales by rate schedule based on the most recent 12 months of data. Please indicate where current rate schedules would be discontinued and/or replaced with substitute or newly proposed rates.

RESPONSE: See EAA 8-7 on the enclosed CD for a list of all current rate schedules with the customer counts and associated kWh sales by rate schedule based on the most recent 12 months of data. The Excel file on the CD is not identified by Bates number.

RESPONDENT: Toby Voge

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EAA 8-8 How long does TEP anticipate that it would take to transfer all existing residential and general service TOU customers to the newly proposed TOU rate schedules?

RESPONSE: The residential and general service customers that will be moved from an existing TOU tariff (R-70, R-21 and R-76) to a new TOU tariff can be moved within 18 months.

RESPONDENT: Bentley Erdwurm

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EAA 8-9 Please generally describe TEP's current and proposed TOU metering technology.

a) What type of meters does TEP currently utilize for TOU? Please identify the meter cost and installation cost for this type of meter? Please identify the life of the meter?

b) Are the meters referred to in part a) above able to be reprogrammed in the field to accommodate a change in peak or shoulder periods?

c) Will current TOU meters need to be replaced to accommodate TEP's TOU proposal? If so, please identify the type of meter that TEP would purchase to implement its TOU program. Please identify the meter cost and installation cost for this type of meter? Please identify the life of the meter?

d) Is TEP currently installing or proposing to install AMI or AMR metering systems? Please describe TEP's efforts to adopt "smart metering" technologies.

RESPONSE:

a) TEP currently uses the following meter types manufactured by Itron for TOU: Centron C12.19, modelC1ST, Class ("CL") 200 and CL320, Module type Time-of-Use for residential TOU customers.

The meter cost is $80 for the CL200 and $189 for the CL320. It costs approximately $60 per installation to exchange and process a meter to install a TOU meter

These meters are all electronic so the manufactures' life expectancy is extended each year as the meters accrue time in the field. Currently, the manufacturer anticipates a life expectancy of 20 years.

b) The meters have an optical port to allow modifications to the calendars and schedules stored in the meter.

c) Potentially, TOU meters will need to be replaced to accommodate TEP's proposal; this is currently under review.

TEP is looking into the use of two different meters for the implementation of the mandatory TOU program. The first meter is

the same meter and type as indicated in EAA 8-9 (a) with the addition of three electronic radio transmitters ("ERT's") and interval data messaging capabilities. The cost for this meter is $150 for the CL 200 and $400 per meter for the CL 320. The second meter type, has one ERT and interval data messaging capabilities. The cost of these meters is $47 per meter for the Class 200 and $150 per meter for the Class 320 meter. It costs approximately $60 per installation to exchange and process these meters.

These meters are all electronic. The manufactures' life expectancy is extended each year as the meters accrue time in the field. Currently the manufacture anticipates a life expectancy of 20 years.

d) TEP is currently deploying AMR meters with ERT technology for all residential customers. The meter reads are read remotely by handheld devices which receive the ERT information from the meters. As a pilot project, TEP has deployed a meter reading fixed network that reads the meter ERT information every five minutes to evaluate and test the technology for a broader implementation within the service territory. TEP is looking into the use of three ERT meters and Interval Data Messaging "IDM" ERT-enabled meters in conjunction with mobile collection and a fixed network to support the mandatory TOU program.

TEP is looking into the use of ERT technology on other rate class meters and a Meter Data Management ("MDM") system to collect and store all meter reading information. The MDM would be able to aggregate interval data as a solution to create the billing requirements for any rate structure and provide the information to the billing system. The MDM in conjunction with a fixed network would also allow for Positive Power On and Restoration Notifications to be integrated into our Outage Management System. This provides end-use customer reporting of system status without relying on customer notification of power outage conditions. The information would also be available to integrate into other enterprise applications or functions such as Load Research, Planning, Customer Reporting, GIS, etc., to support the

function and to provide better decision making opportunities due to the new data. TEP is evaluating AMI technology for potential use with the Direct Load Control ("DLC") Program to control thermostats, provide in-home displays and provide remote connect and disconnect capabilities.

RESPONDENT: Jim Taylor

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EAA 8-10 Please identify the estimated incremental costs that TEP would incur as a result of its TOU proposal annually for the first 5 years of implementation for new customers and existing customers. Please segregate costs at a minimum into incremental installation costs, incremental information technology cost, and incremental meter cost. Please indicate where these costs would be recorded as a DSM expense.

RESPONSE: Although the details have not yet been finalized, the following table shows the anticipated incremental cost for Commercial and Residential TOU, exclusive of any meter hardware or meter installation costs. See the response to EAA 8-9 for meter and installation costs. The incremental information technology infrastructure cost has not been assessed at this time. TEP expects that the system could be fully deployed in the first year of the program. As such, the costs represented in 2008 account for the system installation, while the out year costs reflect ongoing maintenance and operating costs. All costs would be recorded as a DSM expense.

INITIAL START-UP YEAR 1		
MARKETING	Labor	$40,000
ADMINISTRATION	Labor	$40,000
MARKETING	Delivery	$70,000
Total Residential & Commercial		$150,000

ANNUAL ON-GOING COST		
MARKETING	Labor	$14,000
ADMINISTRATION	Labor	$30,000
MARKETING	Delivery	$31,000
Total Residential & Commercial		$75,000

NOTE: Incremental cost for information technology infrastructure, meter installation and cost of meters were not included in cost benefit analysis.

RESPONDENT: Bentley Erdwurm

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EAA 8-11 Cost effectiveness for DSM is measured through the societal cost test. Has TEP determined that its proposed TOU program is cost effective? Please submit TEP's cost benefit analysis to Staff.

RESPONSE: TEP has completed an initial preliminary Total Resource Cost ("TRC") test (excluding environmental externalities) that shows cost effectiveness. The cost/benefit analysis shows an initial TRC of 1.56 for Residential TOU and an initial TRC of 1.61 for Commercial TOU.

RESPONDENT: Bentley Erdwurm

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Direct Load Control Programs

EAA 8-12 Please identify the terms and conditions of the direct load control programs generally.

a) Please submit a copy of the contract that customers would sign as a participant in TEP's proposed direct load control programs.

b) Are customers able to override a company initiated load control period? If so, would these customers pay a penalty and how would that penalty be calculated?

c) What is the term of the contract under these programs?

d) Would customers be able to voluntarily end their participation in the program if they determine that they are unable to accept utility initiated load control periods?

e) Are there any time limits or parameters placed on the load control periods proposed by TEP in the air conditioning cycling program to protect customers from being subject to unusually high temperatures in their homes or businesses during the summer peak periods?

f) Does the customer pay a cost or receive compensation to participate in the program?

RESPONSE:

a) A DLC customer contract has not been designed at this time.

b) Although final details have not been designed, TEP anticipates the customer will have some limited override ability during a Company initiated load control period, such as for customer health reasons.

c) Although final details have not been designed, TEP anticipates the minimum contract term will be one summer season (May through September).

d) Although final details have not been designed, TEP anticipates allowing a voluntary withdrawal from participation after the minimum contract term if the customer is unable to accept the utility initiated load control periods.

e) DLC will only be initiated when the marginal price of purchased power exceeds $90/MWh. For customers using a control switch, the DLC cycling strategy includes a combination of 25%, 50% and 75% duty cycle. This strategy allows air conditioners to operate for a portion of each hour to prevent unusually high temperatures in the home. While the detail application of the cycling strategy has yet to be designed, TEP anticipates the ability to use the 25% cycling strategy during unusually high temperatures to minimize temperature changes in conditioned spaces. For customers using control thermostats, a combination of a two degree or four degree increase in thermostat temperature set-points will be initiated. By allowing only minor temperature increases at the thermostat, customers should not experience unusually high temperature variations in homes or businesses. TEP will also allow customers limited ability to override during select temperature conditions.

f) For customers installing switches, the customers will receive a one-time cash incentive of $50. For customers installing thermostats, the incentive will be a new thermostat.

RESPONDENT: Denise Smith

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EAA 8-13 What specific set of criteria would TEP utilize in determining whether or not it should initiate a load control period under the air conditioning cycling program and the programmable thermostat program?

RESPONSE: Customers must have air conditioning or electric heat pumps installed as their primary source of cooling. DLC will only be initiated when the marginal price of purchased power exceeds $90/MWh or during extraordinary events that pose a risk to system reliability. Events would primarily occur during the months from May through September and during peak hours from 1:00 p.m. through 8:00 p.m.

RESPONDENT: Denise Smith

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EAA 8-14 Staff would like an estimation of the frequency and duration of load control periods that customers could expect under TEP's proposed load control programs. Had the proposed direct load control programs been in effect during 2006, generally which months and which time-periods would TEP estimate that load control periods could have occurred?

RESPONSE: During 2006, if the criteria described in EAA 8-13 for DLC were in effect, control would have been initiated for a total of 29 hours, primarily during the month of July between the hours of 1:00 p.m. and 8:00 p.m.

RESPONDENT: Denise Smith

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EAA 8-15 When does TEP propose that the direct load control program would go into effect? For instance, at the conclusion of this proceeding or after some future proceeding such as a rate case.

RESPONSE: The DLC Program would go into effect after a final resolution of all tissues raised in the case.

RESPONDENT: Denise Smith

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EAA 8-16 Please identify the estimated incremental cost that TEP would incur as a result of its air conditioning cycling and the programmable thermostat program annually for the first 5 years of implementation. Please segregate costs at a minimum into incremental installation costs, incremental information technology cost, and incremental equipment cost. Please indicate where these costs would be recorded as a DSM expense.

RESPONSE: Although all details have not been completed, the following table shows the anticipated incremental cost for Commercial and Residential DLC. TEP expects that the system could be fully deployed in the first year of the program. As such, the costs represented in 2008 account for the system installation, while the following year's costs reflect ongoing maintenance and operating costs. All costs would be recorded as a DSM expense.

DLC Budget Total

Year	2008	2009	2010	2011	2012
DLC equip and labor	$3,245,918	$82,364	$84,835	$87,380	$90,001
Incentives	$535,822	$0	$0	$0	$0
Engineering labor	$150,000	$95,481	$98,345	$101,296	$104,335
Marketing labor	$95,000	$57,289	$59,007	$60,777	$62,601
Admin labor	$125,000	$63,654	$65,564	$67,531	$69,556
Marketing delivery	$170,000	$58,350	$60,100	$61,903	$63,760
Outside support labor (year 1)	$195,000	$0	$0	$0	$0
Page system #1 (per month)	$9,000	$9,548	$9,835	$10,130	$10,433
Page system #2 (per month)	$9,000	$9,548	$9,835	$10,130	$10,433
Other DLC vendor costs (license, etc)	$300,000	$0	$0	$0	$0
Annual Total	$4,834,742	$376,237	$387,526	$399,154	$411,130

RESPONDENT: Denise Smith

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EAA 8-17 Cost effectiveness for DSM is measured through the societal cost test. Has TEP determined that its air conditioning cycling and programmable thermostat programs are cost effective? If so, please submit TEP's cost benefit analysis to Staff.

RESPONSE: TEP has completed an initial TRC test (excluding environmental externalities) that shows cost effectiveness. The cost benefit analysis shows an initial TRC of 1.055 for Residential and an initial TRC of 1.016 for Commercial.

RESPONDENT: Denise Smith